

**WHAT WE CLAIM IS:**

1. An endophyte of *Neotyphodium coenophialum* species, selected from the group consisting of: AR512; AR513; AR514; AR517; AR521; AR522; AR524; AR525; AR535; AR539; and combinations thereof; AR512; AR513; AR514; AR517; AR521; AR522; AR524; AR525; AR535, AR539 being cultures deposited on 2 October 2002 at the Australian Government Analytical Laboratories (AGAL) with accession numbers: NM02/31935; NM02/31936; NM02/31937; NM02/31938; NM02/31939; NM02/31940; NM02/31941; NM02/31942; NM02/31943; NM02/31944;

characterised in that, in combination with a host grass, said endophyte does not cause symptoms of toxicosis in animals;

and further characterised in that the endophyte retains sufficient levels of at least two alkaloids selected from the group consisting of: agroclavine; setoclavine; isosetoclavine; and combinations thereof, that protect the host grass from pests or abiotic stresses or both;

and further characterised in that the host grass is artificially inoculated with the endophyte.

2. An endophyte as claimed in claim 1, characterised in that the toxicosis is fescue toxicosis.

3. An endophyte as claimed in claim 1 or claim 2, characterised in that the toxicosis is caused by ergovaline.

4. An endophyte as claimed in claim 2 or claim 3 characterised in that the level of ergovaline is less than 0.4 ppm in dry matter in herbage consumed by grazing animals.

5. An endophyte as claimed in either claim 3 or 4, characterised in that the level of ergovaline is less than 0.4 ppm in dry matter in herbage, other than the crown of the host grass plant, consumed by grazing animals.

6. An endophyte as claimed in any one of the preceding claims characterised

in that the abiotic stress is a water deficit.

7. An endophyte culture of *Neotyphodium coenophialum* species, selected from the group consisting of: AR512; AR513; AR514; AR517; AR521; AR522; AR524; AR525; AR535; AR539; and combinations thereof; AR512; AR513; AR514; AR517; AR521; AR522; AR524; AR525; AR535, AR539 being cultures deposited on 2 October 2002 at the Australian Government Analytical Laboratories (AGAL) with accession numbers: NM02/31935; NM02/31936; NM02/31937; NM02/31938; NM02/31939; NM02/31940; NM02/31941; NM02/31942; NM02/31943; NM02/31944;

characterised in that, in combination with a host grass, said endophyte culture does not cause symptoms of toxicosis in grazing animals;

and further characterised in that said endophyte culture retains sufficient levels of at least two alkaloids selected from the group consisting of: agroclavine; setoclavine; isosetoclavine; and combinations thereof, that protect the host grass from pests or abiotic stresses or both;

and further characterised in that the host grass is artificially inoculated with the endophyte culture.

8. An endophyte culture as claimed in claim 7 characterised in that the endophyte culture is an axenic culture.

9. An endophyte culture as claimed in claim 7 or claim 8, characterised in that the toxicosis is fescue toxicosis.

10. An endophyte culture as claimed in any one of claim 7 to 9, characterised in that the toxicosis is caused by ergovaline.

11. An endophyte culture as claimed in claim 9 or claim 10 characterised in that the level of ergovaline is less than 0.4 ppm in dry matter in herbage consumed by grazing animals.

12. An endophyte culture as claimed in any one of claims 9 to 11, characterised in that the level of ergovaline is less than 0.4 ppm in dry matter in herbage, other than the crown of the host grass plant, consumed by grazing animals.

13. An endophyte culture as claimed in any one of claims 7 to 12 characterised in that the abiotic stress is a water deficit.
14. A combination of an endophyte as claimed in any one of claims 1 to 6, and a host grass.
15. A combination of an endophyte culture as claimed in any one of claims 7 to 13, and a host grass.
16. A combination as claimed in either claim 14 or 15 characterised in that said combination is achieved by modification of host grass infected with the endophyte or endophyte culture by methods selected from the group consisting of: breeding; crossing; hybridisation; genetic modification; and combinations thereof..
17. A combination as claimed in any one of claims 14 to 16 characterised in that said host grass is selected from the group consisting of: tall fescue grass cultivar; ryegrass cultivar; meadow fescue cultivar; and combinations thereof.
18. A combination as claimed in any one of claims 14 to 16 characterised in that said host grass is a Poideae grass.
19. A combination as claimed in any one of claims 14 to 18 characterised in that the combination produces isosetoclavine and setoclavine at a rate of greater than 0.5 ppm each of dry matter in the host grass plant crowns
20. A combination as claimed in any one of claims 14 to 19 characterised in that the combination produces less than 0.2 ppm of dry matter of ergovaline in whole herbage.
21. A combination as claimed in any one claims 14 to 20 characterised in that the combination has at least one feature selected from the group consisting of: enhancement of pest protection; resistance to insects; pasture persistence; and a combination thereof.
22. A combination as claimed in any one of claims 14 to 21, characterised in that the combination has the features of enhancement of grazing animal growth and/or increased animal productivity relative to grass infected with known endophytes capable of inducing fescue toxicosis.

23. A combination as claimed in any one of claims 14 to 22 characterised in that the pest, to which increased resistance is conferred on the host grass, is selected from the group consisting of: lesion nematode; root aphid; corn flea beetle; and combinations thereof.
24. Seed of a host grass characterised in that the seeds are from a host grass infected with endophyte as claimed in any one of claims 1 to 6.
25. Seed of a host grass characterised in that the seeds are from a grass infected with an endophyte culture as claimed in any one of claims 7 to 13.
26. An endophyte as claimed in any one of claims 1 to 6 and substantially as hereinbefore described with reference to the accompanying examples.
27. An endophyte culture as claimed in any one of claims 7 to 13 and substantially as hereinbefore described with reference to the accompanying examples.
28. A combination as claimed in any one of claims 14 to 23 and substantially as hereinbefore described with reference to the accompanying examples.
29. Seed as claimed in either claims 24 or 25 and substantially as hereinbefore described with reference to the accompanying examples.